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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,472	11/06/2001	Mohammed N. Islam	069204.0176	9249

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EXAMINER	
HUGHES, DEANDRA M	

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 05/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/005,472	ISLAM, MOHAMMED N.	
	Examiner	Art Unit	
	Deandra M Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-102 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,3,6-24,27-47,50-53,56,58,61-68,75-80,83-90 and 93-102 is/are rejected.

7)☒ Claim(s) 2,4,5,25,26,48,49,54,55,57,59,60,69-74,81,82,91 and 92 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7, 8 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The MPEP states the following with respect to large information disclosure statements:

> *Although a concise explanation of the relevance of information is not required for English language information, applicants are encouraged to provide a concise explanation of why the English-language information is being submitted. Concise explanations (especially those that point out the relevant pages and lines) are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of* ***a section that is highly relevant to patentability*** *or where a large number of documents are submitted and* ***applicant is aware that one or more is highly relevant to patentability.*** -- M.P.E.P. § 609 (emphasis added).

"Aids to Compliance With Duty of Disclosure," item 13:

> ***It is desirable to avoid the submission of long lists of documents if it can be avoided.*** *Eliminate clearly irrelevant information and marginally pertinent cumulative information. If a long list is submitted,* ***highlight those documents which have been specifically brought to Applicant's attention and/or are known to be of the most significance.*** -- M.P.E.P. § 2004 (emphasis added).

Therefore, it is recommended that if any information that has been cited by Applicant in the Information Disclosure Statement(s) is known to be material to patentability as defined by 37 C.F.R. § 1.56, Applicant should present a concise statement as to the relevance of that/those particular documents.

Double Patenting

2. The claims listed below rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the listed respective claims of U.S. Patent No. 6,335,820 B1 in view of Kidorf (US 6,181,464).

Claim Number of Instant Application	Claim Number of US 6,335,820 B1
1	1
3	1
6	2
7	3
8	4
9	5
10	6
11	7
12	8
13	9
14	10
15	11
16	12
17	13
18	14
19	15
20	16
56, 58, and 61-64	17 and 18

With regard to claims 1, 3, 6-20, 56, 58, and 61-64, U.S. Patent No. 6,335,820 B1 does not claim a plurality of pumps for the Raman amplifier. However, Kidorf teaches, as it is well known in the art, the use of a plurality of pumps for pumping a Raman amplifier (fig. 7, #32 and #33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a plurality of pumps for pumping the Raman amplifier for the advantage of amplifying a WDM'd signal.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 21-24, 27-47, 65-68, 75-80, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb (US 5,623,508 published Apr. 22, 1997) in view of Bhagavatula (US 4,715,679 published Dec. 29, 1987). Grubb does not disclose that the cutoff wavelength of at least one of the Raman amplifiers is less than at least one of the one or more pump wavelengths. However, Bhagavatula teaches that cutoff wavelength of the fiber should be less than the operating wavelength of the fiber for the advantage of maintaining the fiber at a single mode (fig. 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a cutoff wavelength that is less that the pumping wavelength for the advantage of removing higher order modes from the fiber.

** Please note that the language "an optical fiber cut-off wavelength of at least one of the first length of Raman fiber and the second length of Raman amplifier fiber that is less than the one or more pump wavelengths" is extremely broad. In particular, *any* cutoff wavelength less than the highest pump wavelength reads on the claim.

5. Claims 50-53, 87-90, 93-96 rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb (US 5,623,508 published Apr. 22, 1997) in view of Kinoshita (US 6,342,965 filed Mar. 19, 1996). Grubb does not specifically teach wavelength multiplexing (WDM) and/or polarization multiplexing of the pump wavelengths. However, Kinoshita teaches wavelength multiplexing and polarization multiplexing of pump wavelengths for Raman amplification (col. 20, lines 59-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to WDM

and/or polarization multiplex the pump signals for the advantage of amplifying more than a single wavelength of a WDM'd transmission signal.

6. Claims 97-98 and 100-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Grubb (US 5,623,508 published Apr. 22, 1997) in view of Grubb (US 6,344,922 filed Feb. 19, 1999). Grubb '508 does not disclose that the Raman amplifying fiber is selected with a small effective core area and a high germanium doping. However, Grubb '922 teaches that a highly doped germanium fiber with a small effective core area for use as Raman amplifier (col. 7-8, lines 64-67 and lines 1-8, respectively; also col. 4, lines 34-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a fiber with high germanium doping and a small effective area for Raman amplification for the advantage of, as is taught by Grubb '922, decreasing the loss of the fiber while increasing the gain variation profile.

7. Claim 99 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb (US 5,623,508 published Apr. 22, 1997) in view of Grubb (US 6,344,922 filed Feb. 19, 1999), as applied to claim 97 above, and further in view of Bhagavatula (US 4,715,679 published Dec. 29, 1987). Grubb '508 in view of Grubb '922 does not disclose that the cutoff wavelength of at least one of the Raman amplifiers is less than at least one of the one or more pump wavelengths. However, Bhagavatula teaches that cutoff wavelength of the fiber should be less than the operating wavelength of the fiber for the advantage of maintaining the fiber at a single mode (fig. 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a cutoff wavelength

that is less that the pumping wavelength for the advantage of removing higher order modes from the fiber.

Allowable Subject Matter

8. Claims 2, 4-5, 25-26, 48-49, 54-55, 57, 59-60, 69-74, 81-82, and 91-92 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regard to claims 2 and 57, the prior art does not teach or suggest the combination of the following features:

- a first Raman amplifier stage having a noise figure of less than 8dB coupled to a second Raman amplifier stage having a gain level of less than 5dB
- the first Raman amplifier stage has a noise figure less than the second Raman amplifier stage
- a pump shunt coupled to the optical fiber, wherein at least a portion of the one or more pump wavelengths is coupled between the first length of the Raman amplifier fiber and the second length of Raman amplifier fiber
- *wherein the pump input port is positioned <u>between</u> the first and second lengths of Raman amplifier fiber.*

With regard to claims 4-5, 25-26, 48-49, 54-55, 59-60, 69-74, 81-82, and 91-92 the prior art does not teach or suggest the combination of the following features:

length of the Raman amplifier fiber and the second length of Raman amplifier fiber

- a distributed Raman amplifier coupled to the signal input port

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kubo et al discloses an optical amplifier.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M Hughes whose telephone number is 703-306-4175. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Black can be reached on 703-305-9707. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

DMH
May 4, 2003

Thomas G. Black

THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP 3600